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POWERY MILDEW ON BROOM RAPE
(OROBANCHE)

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POWDERY MILDEW ON BROOM RAPE (OROBANCHE)

/Following is a translation of the Russian language article by G. V. Poletayeva, V. N. Greshnova and O. B. Natal'ina, Saratov Agricultural School, which was submitted on 24 March 1962. The article appeared in Botanical Journal, No. 48, Jan 1963, p 126. Translation performed by Sp/6 Charles T. Ostertag Jr./

In old and new monographs devoted to the powdery mildews (Salmon, 1900; Yachevskiy, 1927; Golovin, 1960; Vasyagina et al. 1961) there are no indications of their affecting broom rape.

In the beginning of September 1961, on the Astrakhan test station farm (Tabala village, Kazymyaskiy Rayon) G. B. Poletayeva discovered a strong affection by powdery mildew of Egyptian broom rape (Orobancha aegyptiaca Pers.) which was in the phase of flowering and the ripening of the capsule seedcase.

On the affected plants there was a thin coating of mycelium and fructifications of the fungus which covered the stalks up to the flowers. The powdery mildew was found in the conidial stage; it formed a network of colorless, barrel-shaped, unicellular spores (Oidium sp.). The copiousness of the powdery layer spoke for the massive spore formation of the fungus. Due to the strong development of Oidium sp. the plants had a white cream-colored tinge and the characteristic fungous odor.

Powder mildew was found on broom rape which was growing, as the investigation showed, directly on the roots of melon. The plant-host itself, a melon of the "Zaami" Central Asian variety, was affected in mass by the powdery mildew Sphaerotheca fuliginea Poll. Not only were conidia developed in this fungi but also a large amount of mature cleistocarps, thanks to which its precise determination was fully possible. The leaves, petioles and shoots of the melon were affected 100%. This caused oppression and premature drying out. The melon was being cultivated in a lemon plot and was irrigated. It was extremely dense, which created favorable conditions for the development of powdery mildew. There was a lot of broom rape in the plot and all of it was affected by powdery mildew, but there was no ascomycetous stage on it which prevented the possibility of precisely determining the fungi. Judging from the general nature of the affection (brownish conidial film) we consider that this was the fungus Sphaerotheca fuliginea Poll. which had passed over from the melon.

Our observations of the affection of broom rape by powdery mildew are of a considerable theoretical and practical interest. First of all the fact is important that powdery mildew was detected on a plant on which up to the present time it hadn't been noted. Besides that, the affection of broom rape is interesting from an evolutionary

point of view. Broom rape became the object of affection apparently as a parasitic plant, being nourished at the expense of a plant-host, which evidently caused the proximity of the biochemical structure of the tissues of the broom rape and the melon. This then led to the possibility of the settlement of an obligate parasite - the powdery mildew fungus Oidium sp. - on a new plant substrate. Under favorable conditions the property of the fungus to affect broom rape evidently could hereditarily be strengthened which could lead to the origination of an independent species of powdery mildew on broom rape.

In connection with the material presented we consider it expedient to report yet another interesting fact - the finding, on common broom rape Orobancha cumana L. which grows on the roots of corn, of the blister smut of corn Ustilago zeae (Berk.) Ung.

In 1960, while on an excursion with students to training farm No 2 of the Saratov Agricultural Institute (Saratov rural rayon) V. N. Greshnova found on the corn one stalk of broom rape with a typical affection by this smut. The smut swelling was disposed on the stalk of the broom rape and was in the stage of forming a spore mass.

This affection of corn by broom rape is an evolutionary new phenomenon exposed by V. N. Greshnova in the Saratov Oblast and V. A. Lebedeva and A. V. Yershova (1961) in the Astrakhan Oblast, but not yet noted in the lists of A. A. Yachevskiy (1929) and in F. Ye. Nemliyenko's monograph on diseases of corn (1957).

The finding of blister smut of corn on broom rape is a phenomenon but it is very possible that in the evolutionary process of the fungus Ustilago zeae Ung. the property is formed in it to affect also the broom rape which is parasitic on the corn.

Bibliography

1. Vasyagina, M. P. et al. (1961) The Flora of Spore Plants of Kazakhstan, III, Powdery Mildews.
2. Golovin, P. N. (1960) Powdery Mildews Parasitizing Cultured and Useful Plants.
3. Lebedeva, V. A. and Yershova, A. V. (1961) Some Experiments with Broom Rape, Protection of Plants, 6.
4. Nemliyenko, F. Ye., (1957) Diseases of Corn.
5. Simonyan, S. A. (1959) Powdery Mildews of the Armenian SSR, XII, ch I, Proceedings of the Bot. Inst. of the AN, Arm SSR.
6. Yachevskiy, A. A. (1927) Pocket Guide of Fungi, 2, Powdery Mildews.
7. Yachevskiy, A. A. (1929) Manual of Phytopathological Observations.
6. Salmon, E. S. (1900) A monograph of the Erysiphaceae, Mem. Torrey Bot. Club, IX.